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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,176	09/28/2001	Elrick Lennaert Cornelius	47161-00026USPT	5504

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EXAMINER

LAO, LUN S

ART UNIT	PAPER NUMBER
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2643

DATE MAILED: 07/30/2004

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/966,176

Applicant(s)

CORNELIUS ET AL.

Examiner

Lun-See Lao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38-47 and 59-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38-47 and 59-80 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. This action responds to amendment filed on 05-13-2004. Claims 38—47, 59-80 are pending and claim 38 has amended and claims 1-37 and 52-58 have been cancelled. Claims 59-80 have been added.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 38-42, 67-70, 76 and 79-80 are rejected under 35 U.S.C. 102(b) as being anticipated by Van Halteren (US PAT. 5,255,246).

Consider claim 38, Van teaches a microphone comprising:

a diaphragm (see fig.1, 107);

a backplate (105) opposing said diaphragm;

a spacer (108) element positioned adjacent said diaphragm (see col.3 line 60-col.4 line13);

a housing (101) having first, second, and third interacting sound chambers, said first sound chamber (107, diaphragm above) being substantially defined by walls of said housing and said diaphragm (107), said second sound chamber (between diaphragm and backplate (107, 105)) being substantially defined by said diaphragm (107), said

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backplate (105), and said spacer element (108), said third sound chamber (between backplate and floor, (101', 105)) being substantially defined by said backplate (105) and walls of said housing (101); and

at least one aperture (114 (through open)) having a distal end and a proximate end, said distal end of said aperture (114) being adjacent said second sound chamber (between diaphragm and backplate (107, 105)) and bounded at least partially by said backplate (105), said proximate end being adjacent said third sound chamber (between backplate and floor, (101', 105)) and bounded at least partially by a structure (106) other than said backplate (105), said aperture (114) connecting said second and third sound chambers ((between diaphragm and backplate (107, 105) and (between backplate and floor, (101', 105)) and inherently having selected dimensional characteristics for dampening a frequency response curve for said microphone (see col.2 line 57-col.3 line 59).

As to claims 79-80, these are the method claims of claim 38 and thus note rejection of claim 38.

Consider claims 39-42, Van teaches the microphone of the relative size of said sound chambers in increasing order from smallest (between diaphragm and backplate (107, 105))(see fig.1) to largest is said second sound chamber (between diaphragm and backplate (107, 105)), said first sound chamber (107, diaphragm above), and said third sound chamber (between backplate and floor, (101', 105)) (see col.3 lines 8-59); and the microphone of the least one aperture is exactly one aperture (see fig.1,114); and the microphone of the least one aperture is exactly two apertures (see fig.7, 719 (slots));

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and the microphone of the least one aperture is at least two apertures (see fig.7, 119 (slots)) (see col.4 line 59-col.5 line10).

Consider claims 67-70 and 76, Van teaches the microphone of the spacer element is made of a polyimide material (SiO_2 and see col.4 line 36-45); and the microphone of the spacer element is made of Kapton (col.3 line 60-col.4 line 13); the microphone of the backplate has a charged surface opposing said diaphragm (see fig.1 and col.3 lines 8-59); and the microphone of the charged surface is Teflon (see col.3 line 22-45); and the microphone of the aperture (see fig.1, 114) is partially plugged by said structure (see fig.2 and col.3 lines 8-59).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Halteren (US PAT 5,255,246) in view of Christensen (US PAT 3,013,127).

Consider claim 44, Van does not teach the microphone at least one aperture has a length of about 0.5 mm and a width of about 0.5 mm.

However, Christensen teach the microphone at least one aperture has a length of about 0.5 mm and a width of about 0.5 mm (approximately .035 x .035 inch) (see col.5 line 13-25).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Van in to Christensen to provide a new and improved sound-transducing apparatus.

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Halteren (US PAT 5,255,246) in view of Van Halteren (US PAT 6,084,972).

Consider claim 44, Van (246) does not teach the microphone at least one aperture has a length of about 0.5 mm and a width of about 0.5 mm.

However, Van (972) teaches the microphone at least one aperture has a length of about 0.5 mm and a width of about 0.5 mm (approximately .7 x .7 mm) (see col.5 line 25-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Van (246) in to Van (972) to provide a an integrated microphone/amplifier unit in miniature, suitable for use in a hearing aid, in which the capacitive couplings are realized with a minimum of space.

5. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Halteren (US PAT 5,255,246) in view of Holesha (US PAT 5,319,717).

Consider claim 47, Van does not clearly teach the microphone at least two apertures dampens the frequency response curve of said microphone at a range of about 2 kHz to about 10 kHz.

However, Holesha teaches the microphone at least two apertures dampens the frequency response curve of said microphone at a range of about 2 kHz to about 10 kHz (see col.3 lines 49-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Van in to Holesha to provide a microphone for hearing aid having a modified high frequency response to reduce or eliminate high frequency oscillation when coupled to a receiver.

6. Claims 59-66 and 71-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Halteren (US PAT 5,255,246) in view of Murphy (US PAT. 4,764,690).

Consider claim 59, Van does not clearly teach the microphone of the housing includes a floor said diaphragm including a membrane frame and a membrane disposed across a surface of said membrane frame, said membrane frame contacting said floor.

However, Murphy teaches the microphone of the housing includes a floor (see fig.1, 12), said diaphragm (18) including a membrane frame (16) and a membrane (18) disposed across a surface of said membrane frame (16), said membrane frame contacting said floor (see fig.1 and col.2 lines 38-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Van into the teaching of Murphy to provide a burr-free spacer surface, thereby providing accurately reproducible spacer

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surface height. The effective spacer height is the difference between height of the spacer minus thickness of electret layer.

Consider claims 60-62, Murphy teaches the microphone of the damping element (24,22) has an outer perimeter, said damping element having a clamping member (62) formed along said outer perimeter and contacting an inner portion of said housing (12), said clamping member (62) holding said spacer in a fixed position within said housing (see col.2 line 37-col.3 line 2); and the microphone of the damping element (20) includes an opening, said opening being dimensioned to hold said backplate (22,24) within said opening (see col.2 lines 37-56); and the microphone of the backplate (22,24) includes a bottom surface (20) opposing said diaphragm (18), said bottom surface having at least one standoff disposed thereon, said at least one standoff contacting said diaphragm (see fig.1, (18) and col.2 lines 37-56).

Consider claims 63-66, Murphy teaches the microphone of the housing includes a bottom surface having at least one support member (see fig.1 (16)), said diaphragm (18) being mounted on said at least one support member (16); and the microphone of the support member (30) is an embossment formed by deforming said housing to create a protrusion extending into said inner volume of said housing (12); and the microphone of the bottom surface of said housing (see fig.1 (12)) includes at least three support members (30,42,16); and the microphone of the diaphragm (see fig.1, (18)) includes an approximately pressure vent for equalizing pressure between (18, diaphragm's chambers) said front volume (54) and said rear volume (52).

Consider claim 71, Murphy teaches the microphone of thickness of the spacer element (see fig.3,20) is at least about 125 microns ((20 (the micron-thick spacer ring puts the tension on the diaphragm)) most preferably greater than 40 microns (see col.1 lines 55-63), therefore it meets limitation of claim 71 (at least about 125 microns)).

Consider claims 72-75, Murphy teaches the microphone of the thickness of said damping element is at least about 50 microns (see col.1 lines 55-63); and the microphone of the thickness of the damping element is less than about 37.5 microns (see col.1 lines 55-63) and the microphone of the damping element is between about 37.5 microns and about 50 microns (see col.1 lines 55-65); and the microphone of the thickness of said damping element is about 35 microns (see col.1 lines 55-63); and the microphone of the front volume (see fig.1 (54)) lacks structure for dampening the frequency response curve of said microphone (see col.2 line 37-55); and the microphone of the structure (see fig.1 (20))(the micron-thick spacer ring puts the tension on the diaphragm) is a spacer element (20) (to maintain a predetermined distance between said diaphragm (18) and said backplate (22,24)).

7. Claims 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Halteren (US PAT 5,255,246) as modified by Christensen (US PAT 3,013,127) as applied to claim 44 above, and further in view of Murphy (US PAT. 4,764,690).

Consider claims 45-46 Van and Christensen do not teach the least one aperture has a thickness of at least about 50 microns; and at least one aperture has an approximately thickness of less than about 37.5 microns.

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However Murphy teaches the least one aperture (20) has a thickness of at least about 50 microns (see col.1 lines 55-63); and at least one aperture has an approximately thickness of less than about 37.5 microns (see col.1 lines 55-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Van and Christensen into the teaching of Murphy to provide a burr-free spacer surface, thereby providing accurately reproducible spacer surface height. The effective spacer height is the difference between height of the spacer minus thickness of electret layer.

8. Claims 43 and 77-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Halteren (US PAT 5,255,246).

Consider claim 43, Van does not teaches at the least one aperture is exactly four apertures. However, Van does indicate that one aperture has a plurality of sub-apertures and it is also well known in the art for one aperture to include a plurality of apertures/sub-apertures. Therefore, it would have been obvious the at least one aperture of Van could have exactly two apertures or exactly four apertures for the purpose of improving frequency characteristics.

Consider claims 77-78, Van does not teach the structure is an adhesive; and the adhesive is UV-cured. However, it is well known in the art to use an adhesive to combine parts and it is also well known that typical industrial adhesives are UV-curable. Therefore, it would have been obvious that Van could have used an UV-curable adhesive to secure the parts in position.

Response to Arguments

9. Applicant's arguments with respect to claims 38-47 and 59-80 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Madaffari (US PAT 4,837,833) is cited to show other related to

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microphone for a hearing aid or listening device with improved internal damping and foreign material protection.

12. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington.


VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (703) 305-2259. The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao, Lun-See
Patent Examiner
US Patent and Trademark Office
Crystal Park 2
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DUC NGUYEN
PRIMARY EXAMINER